

REMARKS

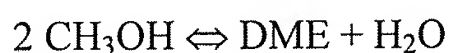
Claims 12-17 are pending in this application.

Claims 12-17 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

In the December 14, 2007 Office Action, the Examiner asserts that the amended claims are not supported by the original application. This assertion is incorrect for at least the following reasons:

Applicants attach (as Exhibit A) a copy of the phase diagram showing the claimed equilibrium mixtures. Independent claim 12 recites equilibrium mixtures of DME (dimethyl ether), methanol and water, which are formed from a methanol-water mixture with 0-20% by weight water, and where 50 to 95% of the methanol is converted.

The equilibrium reaction is as follows:



This means that full conversion of

(a) 64 (=2*32) g feed with 100% methanol, from which 50% is converted according to the above reaction scheme, gives:

32 g methanol, 23 g DME, and 9 g water
which is 36/50/14 wt% DME/methanol/water;

(b) 64 (= 2*32) g feed with 100% methanol, from which 95% is converted according to the above reaction scheme, gives:

3.2 g methanol, 43.7 g DME, and 17 g water

which is 68/5/27 wt% DME/methanol/water;

(c) 80 (= 64+16) g feed with 60% methanol and 20% water, from which 50% of the methanol is converted according to the above reaction scheme, gives:

32 g methanol, 23 g DME, and 25 g water

which is 29/40/31 wt% DME/methanol/water;
and

(d) 80 (= 6+16) g feed with 80% methanol and 20% water, from which 95% of the methanol is converted according to the above reaction scheme, gives:

3.2 g methanol, 43.7 g DME, and 33 g water

which is 55/4/41 wt% DME/methanol/water.

These are the mixtures a), b), c), and d) given on page 6 of the Amendment After Final Action filed on August 29, 2007, and they represent the extreme mixtures of the claimed invention.

These mixtures can also be derived from the diagram (Fig. 1; Exhibit A) as follows.

The lines A and B are reaction lines.

Line A starts at feed 100% methanol, and the line depicts the equilibrium compositions as the reaction progresses and methanol is converted to DME and water.

Line B is the reaction line for a feed with 80 wt% methanol and 20 wt% water.

In the diagram, the horizontal lines show the percentages of DME.

Similarly, the lines parallel to the left hand side of the diagram show the percentages of methanol, and the lines parallel to the right hand side of the diagram show the percentages of water.

Mixture a) is derived from line A (the line for 100% methanol feed) by following the line A from the lower right hand corner (100% methanol) and up to 50% methanol, corresponding to 50% conversion. At this point, it can be read that the mixture contains 36% DME and 14% water.

Similarly, mixture b) is found by following the line A up to 5% methanol, corresponding to 95% conversion. At this point, it can be read that the mixture contains 68% DME and 27% water.

Mixture c) is derived from line B (the line for 80% methanol - 20% water feed) by following the line from the lower right hand corner (80% methanol) and up to 40% methanol, corresponding to 50% conversion. At this point, it can be read that the mixture contains 29% DME and 31% water.

Similarly, mixture d) is found by following the line B up to 4% methanol, corresponding to 95% conversion. At this point, it can be read that the mixture contains 55% DME and 41% water.

Mixtures a), b), c) and d) are shown in the enclosed diagram. It can be seen that the claimed mixtures can be read from the diagram in the area between lines A and B, and between the lines a)-c) and b)-d).

The lower limit (30 wt%) of the DME concentration, the lower limit (5 wt%) of the methanol concentration, and the upper limit (40 wt%) of the water concentration given in presently pending claim 12 slightly differ from the above-calculated values, which are 29 wt%, 4 wt%, and 41 wt%, respectively. This is because (and as set forth in the January 20, 2006 Amendment), the calculated concentrations were written as figures, which were rounded off. In other words, the figures in the presently pending claims are the calculated figures rounded off.

The calculated limits are identical with the original claims, reciting a fuel formed by 50 to 95% conversion of methanol in a methanol-water feed with 0 to 20 wt% water.

Claim 16 recites 48 to 60 wt% DME, 5 to 20 wt% methanol, and the balance (20 to 40 wt%) water. This claim is based on the data given in Table 9 and on Fig. 1. Table 9 shows that a fuel

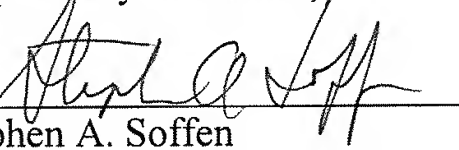
with 48 to 60 wt% DME and 4 to 20 wt% methanol is particularly good, resulting in low amounts of impurities. From Fig. 1 (Exhibit A) it can be read that an equilibrium mixture - coming from the claimed feeds, i.e., the area between lines A and B, and by the dehydration resulting in a fuel with 48 to 60 wt% DME and 5 to 20 wt% methanol - has the balance of water between 20 and 40 wt%.

Claim 17 recites that the feed can contain 0 to 20 wt% ethanol or higher alcohols. This claim is based on the disclosure on page 7, lines 3 and 4, according to which the feed can contain up to 20 wt% ethanol, higher alcohols and water, which may be zero. The first equation given on page 7 shows that ethanol forms diethyl ether (DEE), and the test results given in Table 9 on page 23 demonstrate that the use of a fuel mixture with 10 wt% DEE leads to an exhaust gas with low amounts of especially NO_x and CO emission.

Allowance of all pending claims is solicited.

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EXHIBIT A